SUBSECTION 8.14

Water Resources

8.14 Water Resources

This section evaluates the effect of the CVEC project on water resources. Section 8.14.1 presents the LORS compliance strategy. Section 8.14.2 describes the hydrologic setting, Section 8.14.3 characterizes water use and disposal, and Section 8.14.4 discusses precipitation, storm runoff, and drainage. Section 8.14.5 discusses the project's effects on water resources. Mitigation is discussed in Section 8.14.6. Section 8.14.7 provides the proposed monitoring plans and compliance verification procedures. Section 8.14.8 discusses cumulative impacts. Section 8.14.9 lists the permits required, and Section 8.14.10 provides agency contacts. Section 8.14.11 provides the references consulted in preparing this section.

Water resources potentially affected by the proposed CVEC project include effects on water supply, surface and groundwater water quality, stormwater and flood hazards. The following water resources impacts were investigated:

- Effects on surface waters
- Effects on groundwater recharge, degradation, or depletion
- Stormwater impacts
- Flooding impacts

8.14.1 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to water resources and conformance are discussed in this section and summarized in Table 8.14-1.

8.14.1.1 Federal

The Clean Water Act (CWA) authorizes USEPA to regulate discharges of wastewater and stormwater into surface waters by issuing NPDES permits setting pretreatment standards. The RWQCBs implement these permits at the state level, but USEPA may retain jurisdiction at its discretion. The CWA's primary effect on CVEC is with regard to the control of soil erosion during construction and the need to prepare and implement site-specific erosion control plans and measures for the construction of each project element that will entail the physical disruption or displacement of surface soil. In addition, Section 404 of the CWA regulates wetland disturbance and provides guidance on crossing waterways. The U.S. Army Corps of Engineers (USACOE) administers Section 404 permits for fill of waterways.

8.14.1.2 State

State LORS applicable to this project include CEQA, RWQCB administration of stormwater permits, and CDFG administration of the streambed alteration program.

8.14.1.2.1 California Environmental Quality Act

CEQA requires that projects approved by state agencies be evaluated for their potential to cause adverse environmental impacts, and that impacts be mitigated to the extent feasible and applicable. The CEC meets the requirements of CEQA through the CEQA-equivalent AFC process.

TABLE 8.14-1
Laws, Ordinances, Regulations, and Standards Applicable to CVEC Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
Federal			
Clean Water Act (CWA) as implemented by the Regional Water Quality Control Board (RWQCB)	Regulates stormwater discharge by issuing Construction Activity NPDES Stormwater Permit	NPDES permits for construction stormwater. Prior to construction and plant operation.	RWQCB Brian Earlenson Water Resource Control Engineer 3614 East Ashlan Fresno, CA 93726 559-445-6071
Clean Water Act Section 401	Water Quality Certification	Requires water quality certification for any Section 404 permit; delegated to RWQCB.	RWQCB Brian Earlenson Water Resource Control Engineer 3614 East Ashlan Fresno, CA 93726 559-445-6071
Clean Water Act Section 404	Wetlands disturbance	Section 404 permit for work in jurisdictional wetlands. Required prior to any work below the high water mark of the creek.	USACOE Matt Hirkala Environmental Engineer 1325 J Street Sacramento, CA 95814-2922 916-557-5263
State			
NPDES permit for stormwater, construction, or temporary dewatering	Regulates stormwater discharge (see above)	NPDES permits for construction and industrial stormwater. Prior to construction and plant operation.	Administered through RWQCB, see above.
Title 22 of the CCR	Requirements for the use of sewage effluent in cooling towers	Fresno-Clovis WWTF effluent will meet Title 22 requirements.	Stephen Hogg Wastewater Manager Department of Public Utilities Wastewater Management Division Fresno, CA 93706 559-498-1715

TABLE 8.14-1
Laws, Ordinances, Regulations, and Standards Applicable to CVEC Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
California Water Code 13550 et seq. and Resolution 75-58	Encourages reuse of water for beneficial use	Project will conform through the use of reclaimed water from Fresno-Clovis WWTF.	Paul Lillebo State Water Resources Control Board Environmental Specialist IV 901 P Street Sacramento, CA 95812 916-341-5551
CDFG (Fish and Game Code, Section 1601)	Streambed Alteration Agreement	401 permit for work affecting surface water. Prior to any work below the high water mark of the creek.	CDFG Dr. Andrew Gordus Environmental Specialist IV 1234 East Shaw Avenue Fresno, CA 93710 559-243-4014
Local			
City of San Joaquin	Approval by City of Grading Plan includes stormwater control requirements	Requires erosion and sediment control plan, drainage control features, and City approval.	City of San Joaquin Shahid Hami City Manager 21900 Colorado P.O. Box 758 San Joaquin, CA 93660 559-693-4311
Fresno County Grading Ordinance	Permits Grading, Erosion and Sediment Control	Required prior to site grading. Application also comprises CEQA, Geotechnical Report, and Erosion and Sediment Control Plan.	Fresno County Planning Department Richard Perkins Planner 2220 Tulare Street, 8th Floor Fresno, CA 93721 559-262-4022
Fresno-Clovis WWTF Agreement to Serve	User Agreement for reclaimed water	Applicant has received a “will serve” letter from Fresno-Clovis WWTF, see Appendix 7A.	Martin McIntyre Interim Public Utilities Director Department of Public Utilities 2600 Fresno Street Fresno, CA 93721

8.14.1.2.2 State Water Resources Control Board and Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (RWQCB) requires a notice of intent to be filed prior to construction activities. Stormwater Pollution Prevention Plans (SWPPPs) must be prepared prior to filing both the Construction and General Industrial Stormwater NPDES permits. The SWRCB Water Quality Order No. 99-08-DWQ applies to construction activity NPDES stormwater permits for construction areas of greater than 5 acres. SWRCB Order 97-03-DWQ authorizes general industrial stormwater permits.

8.14.1.2.3 California Water Code Sections 13550, 13551, 461 and SWRCB Resolution No. 75-58

These water code sections and policy statements encourage the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.

8.14.1.2.4 Title 22 of the California Code of Regulations

Title 22 addresses the use of reclaimed water; in particular Section 60306 sets forth the criteria for the use of reclaimed water for cooling. Such cooling water is defined as disinfected tertiary reclaimed water in Section 60401.230.

8.14.1.2.5 Fish and Game Code Section 1601 Streambed Alteration Agreement

CDFG administers the Streambed Alteration Agreement, which is for actions that would disturb bed and banks of surface streams.

8.14.1.2.6 Water Quality Certification

If a Section 404 permit for fill is required by USACOE, it must be accompanied by a Section 401 permit issued by RWQCB.

8.14.1.3 Local Policies

Local ordinances focus on flood control concerns, stormwater protection, and erosion control as well as use of reclaimed water for cooling. The Fresno County General Plan and San Joaquin Comprehensive General Plan specify policies listed in Table 8.14-2. The conformance of the project with these policies is also provided.

8.14.2 Hydrologic Setting

The climate in the project area is typical of the Central San Joaquin Valley with hot dry summers and mild winters. Daytime temperatures during the summer months range between 80 and 100, with peak days up to 118°F. The rainy season generally extends from November through March. Occasional rains occur during the spring and fall months, but summer months are dry. Average annual precipitation is about 10 inches. Total elevation range on the site is 170 feet.

The project site is located near the center of the valley, approximately midway between the Sierra Nevada to the east, and the Coast Range to the west. The Kings River is the nearest major surface water. It begins southeast of Fresno in the High Sierra, but west of Fresno the river is diverted, channelized and mingles with a web of irrigation canals and diversions from the California Aqueduct and other canals. In the project vicinity, there are no natural surface waters, but canals and drainage canals are abundant. The south side of the project site is bordered by one such canal.

High-quality surface water was brought into the historically dry area from the San Joaquin and Kings rivers. Groundwater is generally deep and alkaline. Both groundwater and surface water are used to meet local domestic and irrigation demands.

TABLE 8.14-2
Fresno County and City of San Joaquin General Plans, Goals, and Policies for Water Supply and Delivery Applicable to the Project

Element	Goal/Policy	Conformance
Fresno County General Plan		
Water Supply and Delivery	PF-C To ensure the availability of an adequate and safe water supply for domestic and agricultural consumption.	Project will conform by using reclaimed water.
	PF-C.1 The County shall actively engage in efforts and support the efforts of others to retain existing water supplies within Fresno County.	Project will conform by using reclaimed water within the County.
	PF-C.26 The County shall encourage the use of reclaimed water where economically, environmentally, and technically feasible.	Project will conform by using reclaimed water within the County.
	OS-D To conserve the function and values of wetland communities and related riparian areas throughout Fresno County while allowing compatible uses where appropriate. Protection of these resource functions will positively affect aesthetics, water quality, floodplain management, ecological function, and recreation/tourism.	Project will conform by avoiding wetland and riparian areas during construction.
	OS-D.1 The County shall support the “no-net-loss” wetlands policies of the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.	Project will conform by avoiding wetland and riparian areas during construction.
	OS-D2. The County shall require new development to fully mitigate wetland loss for function and value in regulated wetlands to achieve “no-net-loss” through any combination of avoidance, minimization, or compensation. The County shall support mitigation banking programs that provide the opportunity to mitigate impacts to rare, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas.	Project will conform by avoiding wetland and riparian areas during construction.
	OS-D.3 The County shall require development to be designed in such a manner that pollutants and siltation do not significantly degrade the area, value, or function of wetlands. The County shall require new developments to implement the use of Best Management Practices (BMPs) to aid in this effort.	Project will conform by implementing erosion and sediment control measures to protect wetlands.

TABLE 8.14-2
Fresno County and City of San Joaquin General Plans, Goals, and Policies for Water Supply and Delivery Applicable to the Project

Element	Goal/Policy	Conformance
	OS-D.4 The County shall require riparian protection zones around natural watercourses and shall recognize that these areas provide highly valuable wildlife habitat. Riparian protection zones shall include the bed and bank of both low- and high-flow channels and associated riparian vegetation, the band of riparian vegetation outside the high-flow channel, and buffers of 100 feet in width as measured from the top of the bank of unvegetated channels and 50 feet in width as measured from the outer edge of the dripline of riparian vegetation.	Project will conform by avoiding wetland and riparian areas during construction.
	OS-E.11 The County shall protect significant aquatic habitats against excessive water withdrawals that could endanger special-status fish and wildlife or would interrupt normal migratory patterns.	Project conforms to policy by using reclaimed water instead of surface water for process uses.
San Joaquin General Plan		
Municipal Water System Policies	1. All future growth-inducing projects will be reviewed for environmental impacts that such development may have upon the existing water sources and distribution facilities.	Project is not considered growth-inducing, but has been evaluated for impacts on existing water sources and distribution facilities.
	3. Water policies shall include conservation measures such as plumbing fixtures that reduce water usage in accordance with the California Administrative Code (Title 24).	Project implements water conservation measures primarily through use of reclaimed water.
	4. The use of drought-tolerant plant species and drip irrigation systems will be promoted.	When landscaping the project site, the use of drought-tolerant species and drip irrigation systems will be promoted.
Drainage System Policies	3. All proposals for growth shall be reviewed for significant negative impacts upon drainage / flood control facilities.	Project is not considered growth-inducing, but has been evaluated for impacts on drainage and flood control facilities.
	4. If proposed development projects are determined to cause significant negative environmental impacts to drainage control facilities, appropriate mitigation measures shall be incorporated into the project.	Project will direct drainage to onsite detention facilities to maintain offsite drainage to pre-project conditions.

Source: Fresno County General Plan (2000), San Joaquin General Plan (1996).

8.14.2.1 Surface Water

8.14.2.1.1 Description

There are no significant natural water features on or adjacent to the project area. There are abundant man-made canals that deliver irrigation water that originates from the Kings River and San Joaquin Delta, and that collect irrigation tailwater. Canals crisscross the fields and parallel the roads, and cross the proposed project linears (gas and water lines) in many places. There are only three named waterways; the California Aqueduct, Fresno Slough, and James Bypass (Figures 8.14-1a, b).

The California Aqueduct is a broad (120 feet), deep canal that originates in Clifton Court Forebay, north of Tracy, California and winds through concrete-lined and packed earth canals and pump stations. The California Aqueduct runs for 120 miles to deliver Delta-quality water to farm fields of the Central San Joaquin. Although no vegetation grows within the canal, there is a nearly continuous band of mesquite-saltbush woodland on both sides of the canal. Water quality is excellent, with low dissolved solids, low turbidity and saturated in oxygen. Sunfish, bass and catfish survive in the canal.

Fresno Slough is a 20-foot-wide channelized canal that carries stormwater and agricultural tailwater. Portions of the slough support dense cattails, grass, willows and other vegetation. But long sections of it are also barren and open with neither water nor vegetation during long periods of the year. Water quality is generally high in salts, turbidity and residues from agricultural fields.

James Bypass is crossed by the proposed waterline approximately 3 miles east of the project. The Bypass itself is 25 feet wide and flowing with high quality irrigation supply water. The canal itself has nearly no vegetation, but the irrigation district maintains a broad floodplain on the east side of the canal that supports a narrow but tall forest of willows, mesquite and saltbush. The remainder of the floodplain supports sparse annual grassland used for grazing cattle.

8.14.2.1.2 Local Use

The City of San Joaquin is the local retail water supplier, providing groundwater for industrial and municipal water uses in the vicinity of the project. San Joaquin's supplies are of adequate quality and quantity to meet the domestic needs of the plant (see Water Supply, Section 7.0; Appendix 7B).

8.14.2.2 Groundwater

The following section describes groundwater resources under the project site and City of San Joaquin. Most of this information came from the Water Master Plan (City of San Joaquin, 1996) and the Initial Environmental Study of the Southeast Area Annexation (City of San Joaquin, 2001). It is unlikely that excavation would encounter shallow groundwater. Since the project would use only small amounts of groundwater for domestic use, the project is anticipated to have no impact to groundwater.

8.14.2.2.1 Regional Setting

Regional groundwater conditions vary considerably from eastern to western Fresno County. Aquifers east of the valley trough are generally semi-confined to unconfined. Water quality is good with the exception of some localized areas. Groundwater overdraft occurs near major cities (notably Clovis and Fresno) and the irrigation and water districts that rely exclusively on groundwater (such as Raisin City Water District and Mid-Valley Irrigation District). The California Department of Water Resources (DWR) has estimated groundwater overdraft at 650,000 acre-feet for 1990 in the Tulare Lake Region, which generally includes Fresno County. Groundwater overdraft conditions vary annually based on demand, surface water availability, and climate. Long-term projections indicate a continuing annual overdraft of the basin underlying most of Fresno County (Fresno County, 2000).

In some areas along the valley trough and in parts of western Fresno County, groundwater pumping has caused subsidence of the land surface. This usually occurs in areas where the groundwater basin

has historically been subject to overdraft and long-term recharge is inadequate to maintain the water table elevation. Subsidence can impact conjunctive use programs by reducing storage capacity and changing transmissivity. In general, subsidence in Fresno County has stabilized, except during droughts. Areas in Fresno County where subsidence has been a problem generally include the Westlands Water District and the Pleasant Valley Water District. The prepared project site is located outside of these areas (City of San Joaquin, 2001; Fresno County, 2000).

8.14.2.2.2 Project Area

The City of San Joaquin uses groundwater as its water source. Annual water production ranged from 125.0 million gallons (MG) to 184.2 MG between 1990 and 1994. In 1994, the City of San Joaquin served a population of 2,781 from 3 existing wells with an average annual pump rate of 172.8 MG, at 329 gallons per minute. A detailed layout of the City's water system can be reviewed in the Master Plan (City of San Joaquin, 1996).

It is unlikely that excavation would encounter shallow groundwater. Since the project would use only small amounts of groundwater for domestic use, the project is anticipated to have no impact to groundwater in the vicinity of the project.

8.14.2.2.3 Reclamation Well Areas

The Fresno-Clovis WWTF operates two wastewater treatment plants with a combined treatment capacity of 88 mgd. The WWTF property comprises 3,290 acres, of which 1,600 acres are effluent disposal ponds. The WWTF currently discharges about 65,000 afy to the ponds.

Groundwater under the WWTF is found in unconsolidated alluvial sand, silt and clay. Low-permeability zones are discontinuous and do not completely separate the intervals into distinct aquifers (Carolo Engineers, 1996). Generally the shallow zone is to a depth of 120 feet and the deep zone is 170 to 250 feet below grade (Carolo Engineers, 1996). Regional direction of groundwater flow is northeast to southwest and has a gradient of 0.002 feet/foot.

As a result of infiltration of treated effluent, a large impaired water mound has developed under the recharge basins. Fresno operates 21 reclamation wells that extract water from beneath the effluent disposal ponds. The City recently installed three new reclamation wells that extract a higher percentage of water from the shallow zone, called "Flowpath" wells. Under the proposed project, CVEC would use up to six new Flowpath wells to take water from the top of the groundwater mound. The potential impact of these wells was modeled using the existing transient MODFLOW model developed by Fresno in 1996 (Carrolo Engineers, 1996). This evaluation indicates that the additional extraction from CVEC would reduce the maximum elevation of the groundwater from 10 to 20 feet, leaving the maximum elevation of the groundwater mound around 220 feet. The groundwater elevation upgradient of the recharge area is around 200 feet (see Figure 8.14-2). The design of the Flowpath wells ensures that withdrawals for CVEC could not reduce available water below the regional groundwater elevation, and thus would have no effect on other groundwater users.

8.14.2.3 Flooding Potential

FEMA flood zone maps show that the CVEC project site and all surrounding areas for a distance of about 2 miles are outside the 100-year flood boundary (Figure 8.14-3). FEMA-designated 100-year flood plains exist east of the James Bypass, approximately 2.5 miles east of the project site.

8.14.3 Water Use and Disposal

This section characterizes the sources of water needed for power generation at CVEC, water quality, and disposal of wastewater.

8.14.3.1 Water Sources

As presented in Sections 2.0 and 7.0, the project will require up to 7,000 afy of water provided by Fresno-Clovis WWTF to meet its cooling and process demands. The relatively small domestic demands for the generating facility's employees would be provided from the City of San Joaquin. The City of Fresno and CVEC have developed a water supply agreement to supply cooling and process water (Appendix 7A). The City has provided a will-serve letter (Appendix 7B) for the domestic demands.

The most recent projections of population growth, development, and agricultural conversion were evaluated by San Joaquin to determine whether water supplies were adequate to serve future customers. Based on San Joaquin's projected future water uses, it is apparent that sufficient water is available to meet its current and future obligations.

Between 1990 and 1994, the City annual water production ranged from 125 to 184 million gallons. In 1994, the City served a population of 2,781 from 3 existing wells with average daily pumpage of 329 gpm (Yamabe & Horne Engineering, 1995). The City plans to add 6 wells to the existing system to serve future growth. The CVEC project would require 1.1 gpm for domestic water, which represents less than 1 percent of City water use. This increment is considered insignificant to water demands of the City, and is not likely to cause any adverse effects.

8.14.3.2 Reclaimed Water Quality

The quality of reclaimed water withdrawn from the Flowpath wells under the Fresno-Clovis WWTF is provided in Table 7.1-1. Water will meet all requirements of Title 22 for reclaimed water.

8.14.3.3 Wastewater Discharges

As discussed in Section 2.0, the process wastewater at the site will be reclaimed in a zero-liquid discharge treatment system. No industrial wastewater will be discharged offsite. Section 8.13 contains a detailed description of the zero-liquid discharge system. As a final step in that process, less than 4 gpm of concentrated brine would be desiccated in drum dryers to result in a dry filter cake or concentrated salt. This non-hazardous material would be collected for offsite disposal at a landfill. As detailed in the process flow schematics of Section 2.0, the quantity and quality of the dry discharge is dependent upon influent water quality.

Sanitary wastewater estimated at 1.1 gpm would be discharged to the City of San Joaquin wastewater system. According to the RWQCB, the City of San Joaquin's Wastewater Treatment Facility (WWTF) is currently operating at or above its design capacity, and the City must complete a WWTF expansion before new development may discharge wastewater to it (Comment letter to Initial Study by California Regional Water Quality Control Board, Central Valley Region, June 26, 2001). The WWTF capacity restriction is caused by the disposal capability of the plant. The City of San Joaquin expects the increased WWTF capacity to be available by January 1, 2002. In the meantime, no connections to the City's wastewater system will be permitted in the annexation area. By the time the CVEC project is constructed, the City will have available wastewater capacity (Horne, 2001).

The quality of water in the cooling towers is dependent upon the quality of source water from Fresno-Clovis WWTF. Table 8.14-3 describes the estimated quality of circulating water in the cooling towers. The estimated quality does not indicate concentrations of constituents that would be expected to cause adverse effects.

TABLE 8.14-3
Estimated Water Quality of Cooling Tower Water

Constituent/Parameter (mg/L except as noted)	Maximum
Alkalinity-Total	258
Aluminum	0.000
Ammonia	0.000
Arsenic	0.020
Barium	0.100
Biological Oxygen Demand	0.000
Boron	0.350
Bromide	0.000
Cadmium	0.000
Chemical Oxygen Demand	0.000
Chloride	74
Chromium	0.000
Copper	0.008
Cyanide	0.000
Fluoride	0.070
Hardness-Calcium	45
Hardness-Magnesium	25
Hardness-Total	0.000
Hydrogen Sulfide	0.000
Iron	0.065
Lead	0.003
Manganese	1.3
Mercury	0.000
Molybdenum	0.000
Nickel	0.017
Nitrate Nitrogen	2.160
Nitrogen-Total	2.280
Phosphate	2.4
Potassium	8.9
Selenium	0.000
Silica	32.7
Silver	0.000
Sodium	70
Specific Conductance (umhos/cm)	790
Strontium	0.376
Sulfate	35
Sulfur	0.000
Total Dissolved Solids	475
Total Mineral Solids	0.000
Total Organic Carbon	0.000
Total Suspended Solids	0.000
Turbidity (NTU)	<1
Volatile and Organic Matter	0.000
Zinc	0.017

8.14.3.4 Water Demand

The estimated monthly water requirements for the project are shown in Table 7.1-1. The 7,000 af annual demand of the project would be supplied with reclaimed water from Fresno-Clovis WWTF.

8.14.3.5 Water Flow and Treatment

The mass balances of water flow and treatment include varying water requirements for different operational conditions. Section 2.0 discusses the facilities for treatment and use of project water. Water balances are presented on Figures 2.2-6a through 2.2-6b. Section 7.0 discusses the facilities for water supply and conveyance.

8.14.4 Precipitation, Stormwater Runoff, and Drainage

Most of the precipitation in the project area falls between November and April. Monthly average rainfall in Fresno, which is similar to that at the project site, is presented in Table 8.14-4. The total annual average rainfall in Fresno is 10 inches.

TABLE 8.14-4
Average Monthly Rainfall Near the Proposed Project Site

Precipitation	Sum	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Avg	10.09	0.54	1.02	1.54	1.88	1.72	1.74	0.95	0.37	0.14	0.01	0.01	0.17
Max	23.59	3.21	7.92	6.73	8.56	6.12	7.24	4.41	2.88	1.93	0.33	0.25	1.78
Min	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Monthly Rainfall at Fresno; DWR # C00 3257 00.

8.14.4.1 Stormwater Runoff Prior to Construction

Currently, stormwater runoff from the project site percolates into groundwater, and may on occasion drain by shallow furrow to the north. Table 8.14-5 shows the rainfall depth expected at various return frequencies and the corresponding total runoff expected at the site. The site is currently farmed, with soil types that have good drainage.

- The total runoff values indicated in Table 8.14-5 are based on the runoff from a site area of 25 acres. This allows a direct comparison to the portion of the final developed site area that will be directed to the proposed stormwater detention pond.

TABLE 8.14-5
Stormwater Runoff Prior to Construction

Return Period of Storm (years)	Rainfall Depth for 24-hr Storm[a] (inches)	Total Runoff from Site for 24-hr Storm (millions of gallons)
10	2.0	0.41
25	2.3	0.46
50	2.5	0.51
100	2.75	0.56

[a] Source: National Oceanographic and Atmospheric Administration (NOAA) Atlas 2, Volume XI, U.S. Department of Agricultural, Soil Conservation Service, Engineering Division.

8.14.4.2 Storm Runoff After Construction

Site Plan Review through the City of San Joaquin is applicable to this project. Site Plan Review and grading requirements would be pursuant to City Ordinance 17.16 (Site Plan Review). An erosion and sediment control plan would be prepared to prevent increased discharge of sediment during grading and development pursuant to the Site Plan Review. After construction, the site would be designed to drain stormwater runoff to an onsite detention pond. Figure 8.14-4 shows the post-construction runoff and drainage patterns. Table 8.14-6 indicates the total stormwater runoff after construction for the 25-acre portion of the developed site that will drain to the stormwater detention pond via a system of pipes, channels, and drains. The cooling tower, landscaping, and natural areas will cover the remaining portion of the 85-acre site.

TABLE 8.14-6
Stormwater Runoff Following Construction

Return Period of Storm (years)	Rainfall Depth for 24-hr Storm (inches)	Total Runoff from Site for 24-hr Storm (millions of gallons)
10	2.0	0.82
25	2.3	0.93
50	2.5	1.02
100	2.75	1.12

[a] Source: NOAA Atlas 2, Volume XI, U.S. Department of Agricultural, Soil Conservation Service, Engineering Division.

8.14.5 Effects on Water Resources

Significance criteria are derived from the CEQA Appendix G checklist. The project is considered to have a potentially significant effect if it would:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or offsite or in flooding on- or offsite.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Cause inundation by seiche, tsunami, or mudflow.

8.14.5.1 Surface Water

There are no significant natural surface waters in the project vicinity. The project site is flat, and would remain generally flat after development. The project would not substantially alter existing drainage patterns. Therefore, the project would cause no substantial erosion or siltation on- or offsite. Similarly, the volume and rate of runoff from the project site would not be substantially altered as a result of project development, nor would the project alter the course of any stream or river. The project would capture and detain stormwater runoff in an onsite detention basin, so the project would not exceed the capacity of existing or planned stormwater drainage systems.

8.14.5.2 Groundwater

The City of San Joaquin would supply domestic water for sanitary needs to the project. The main source of this water is groundwater from local wells. The amounts of water required for domestic and sanitary supply is estimated at less than 2 afy, as compared to the much greater requirements for process water (7,000 afy of reclaimed water). Although the region has generally experienced subsidence related to groundwater pumping, the primary uses are agricultural; not domestic. The domestic supply to the project represents approximately 1 percent of the annual groundwater provided by the City to other users, and would not substantially deplete groundwater supplies or interfere with groundwater recharge. No wells would be expected to drop to a level that would not support existing land uses.

BMPs would be implemented during construction to avoid contamination of groundwater from construction activities. As a result of these measures, groundwater in the project area would not be significantly affected by the project.

8.14.5.3 Reclaimed Water

The project would use reclaimed water from Fresno-Clovis WWTF for all process water needs. Reclaimed water use would have a net positive impact on water resources by reducing the groundwater mound under the recharge ponds and by implementing the State Board's Policy 75-58 for reusing water to the greatest extent practicable.

8.14.5.4 Stormwater

The project site is flat and presently drained by man-made drainages and canals. Development of the site would not change the general slope and aspect, and drainage would be conveyed to an onsite detention pond. Implementation of BMPs during construction and operation would be sufficient to control offsite runoff and prevent offsite sedimentation. During construction and operation, BMPs documented in the SWPPP (part of the NPDES permit) for erosion and sediment control would be implemented to avoid polluting surface waters.

BMPs include designating locations of vehicle parking and maintenance, waste disposal areas, silt fencing, and installation of oil-water separators to prevent pollutants from entering the stormwater system. The project would have no offsite discharges to surface water and, therefore, would not violate water quality standards or waste discharge requirements nor substantially degrade water quality.

8.14.5.5 Water Quality

Local surface water and groundwater quality would not be affected by the project. All process wastewater would be directed to the brine concentrator for re-use. Sanitary wastes would be disposed to the City of San Joaquin wastewater system. An onsite stormwater detention pond would be provided to limit stormwater discharges to preconstruction flow rates. Thus, the project will not have a significant effect on the quantity and quality of stormwater runoff.

Stormwater runoff will be controlled during construction and plant operations through adherence to State Water Resources Control Board SWPPPs. These plans would be prepared as part of the application for both the Construction and General Industrial Stormwater NPDES permits that will be required as part of the project. A description of current erosion conditions is provided in Section 8.9, Agriculture and Soils. Hazardous materials storage and handling and waste handling that must be thoroughly documented in the SWPPPs are presented in Sections 8.12 and 8.13.

8.14.5.6 Flooding Potential

The project is located approximately 2 miles from the nearest 100-year floodplain defined by FEMA (see Figure 8.14-3). Therefore, it would not place housing or structures in the 100-year flood hazard area, nor place structures that would impede or redirect flood flows.

The project would convert up to 25 acres of the existing cultivated soil to packed gravel and pavement. An onsite stormwater detention pond would be used to limit stormwater discharges to preconstruction flow rates.

The general region is flat, and there are no significant dams or levees in the vicinity. Therefore, the project would not expose people or structures to significant risk of loss, injury or death resulting from a levee or dam failure. Similarly the project is located approximately 145 miles from the Pacific Ocean, and any potential inundation from seiche, tsunami, or mudflow is remote.

8.14.6 Mitigation

Implementation of the CVEC project with the following measures would effectively reduce impacts to ground or surface water to less-than-significant.

- The project will use water provided by Fresno-Clovis WWTF for process water needs.
- All process wastewater would be disposed to a zero-liquid discharge system consisting of brine concentrator and drum dryer, to avoid any possible offsite migration of wastewater products.
- No adverse impact to beneficial use of surface water would result from water supply to the project, and no mitigation is required.
- The project will use less than 2 afy of groundwater for onsite domestic uses. This amount is insignificant relative to the productive capacity of the local aquifers. Therefore, no mitigation is required.
- The project would implement Best Management Practices during construction and operation to avoid contamination of any groundwater or surface waters.

8.14.7 Proposed Monitoring Plans and Compliance Verification Procedures

Routine monitoring and compliance verification would be required as part of the stormwater NPDES permitting of the project. The Applicant would be required to prepare a SWPPP specifying BMPs, monitoring and compliance measures to avoid adverse impacts to water quality. No additional monitoring of surface or groundwater would be required because no water quality impacts are expected to occur.

8.14.8 Cumulative Impacts

Cumulative impacts to water resources could occur through the use of reclaimed water, the contribution of domestic sewage, the use of groundwater, or stormwater runoff.

None of these categories of water use is expected to result in significant cumulative impacts to area water resources:

- **Surface Water:** The project area is relatively flat and there are no natural surface water features in the vicinity. Implementation of BMPs during construction and operation would avoid the potential for adverse impacts to surface water from the project.
- **Reclaimed Water**: The use of reclaimed water will have a net positive benefit for water supplies in the region, and groundwater disposal at the Fresno-Clovis WWTF.
- **Plant Sewage**: The proposed plant staff of up to 30 employees will generate insignificant volumes of treated, domestic sewage that would be discharged to the City of San Joaquin WWTP. The cumulative impacts from this additional waste load would not be significant.
- **Groundwater**: The project's groundwater requirements of 2 afy are a very small portion of the overall water demands of the City of San Joaquin and would not be significant and, therefore, would cause no adverse impacts to groundwater resources.
- **Stormwater**: Implementation of the project would increase runoff on up to 25 acres, due to packed earth and gravel, or pavement construction. The impacts of the increased runoff will be mitigated through the use of an onsite stormwater detention pond designed to maintain the discharge of stormwater below the preconstruction flow rates.

8.14.9 Permits Required

Water quality permits required for the project include the following:

- A State Department of Health Services (DHS) Title 22 Engineering Report for permitting reclaimed water use for cooling water (see Section 7.0)
- RWQCB Construction Activity NPDES Stormwater Permit, General Permit
- RWQCB General Industrial NPDES Stormwater Permit, General Permit
- Streambed Alteration Agreement (Section 1601) for modifications to any creek, if required for construction of the water or gas pipelines
- U.S. Army Corps of Engineers Wetlands fill permit Section 404 for fill in jurisdictional wetlands
- Water Quality Certification Section 401, from the RWQCB, if 404 permit required

A summary of required permits is provided in Table 8.14-7.

8.14.10 Agency Contacts

Agency contacts and required permits are listed in Table 8.14-7.

TABLE 8.14-7
Permits and Permitting Agencies for CVEC Water Resources

Permit	Schedule	Agency
San Joaquin Grading Plan Approval	90 Days Prior to Site Grading	City of San Joaquin Shahid Hami City Manager 21900 Colorado P.O. Box 758 San Joaquin, California 93660 559-693-4311
Construction Activity NPDES Stormwater Permit	90 Days Prior to Site Grading	RWQCB Brian Earlenson Water Resource Control Engineer 3614 East Ashlan Fresno, CA 93726 559-445-6071
General Industrial NPDES Stormwater Permit	90 Days Prior to Stormwater Discharge	RWQCB Brian Earlenson Water Resource Control Engineer 3614 East Ashlan Fresno, CA 93726 559-445-6071
Streambed Alteration Agreement 1601	90 Days Prior to Crossing Stream	CDFG Dr. Andrew Gordus Environmental Specialist IV 1234 East Shaw Ave Fresno, CA 93710 559-243-4014
Wetlands Permit 404 (and Water Quality Certification, Section 401)	90 Days Prior to Crossing Stream	USACOE Matt Hirkala Environmental Engineer 1325 J Street Sacramento, CA 95814-2922 916-557-5263

8.14.11 References

California Energy Commission (CEC). 2000. Final Staff Assessment for Metcalf Energy Center.

Carrolo Engineers. 1996. Master Plan Report, Task 700, Technical Memorandum No. 3: Evaluation of Reclamation Operations and Recommended Groundwater Monitoring Program. Prepared by Luhdorff and Scalmanini, Inc. August.

Federal Emergency Management Agency (FEMA). 2000. Flood Insurance Rate Map, Fresno County.

Fresno, County of. 2000. General Plan. August 2000.

Horne, Gary, 2001. City of San Joaquin City Manager. Personal Communication with EJ Koford/CH2M HILL. October 8.

National Oceanic and Atmospheric Administration (NOAA). Not dated. Atlas 2, Volume XI. U.S. Department of Agriculture, Soil Conservation Service, Engineering Division.

San Joaquin, City of. 1996. Water Master Plan. General Planning Partners.

San Joaquin, City of. 2001. Initial Study and Negative Declaration for Southeast Area Annexation. July.

Yamabe & Horn Engineering. 1995. City of San Joaquin Water Master Plan. July.

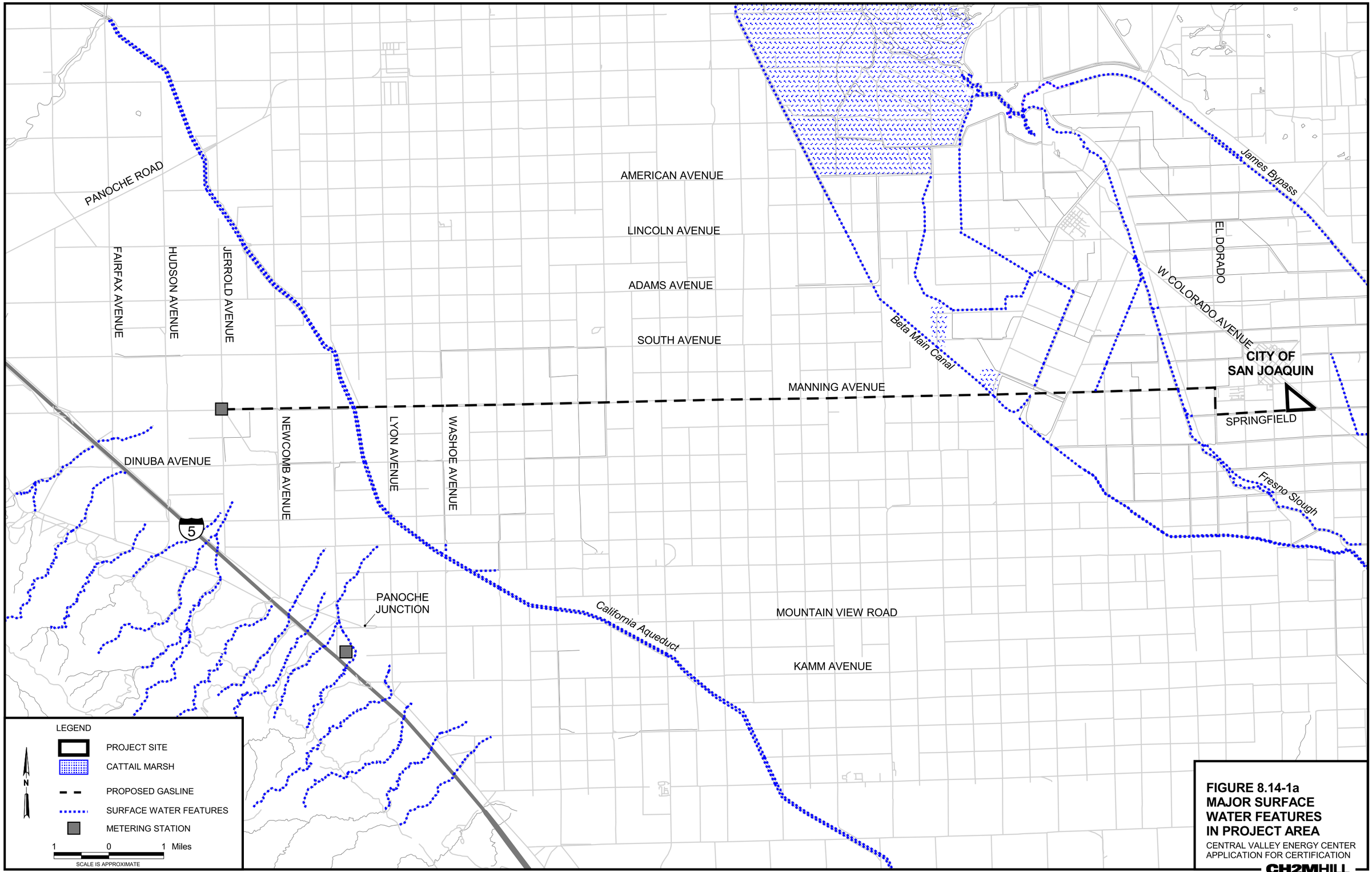


FIGURE 8.14-1a
MAJOR SURFACE WATER FEATURES IN PROJECT AREA
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION

CH2MHILL

CH2M Hill RDD ArcView Project File \\Thor\Cart1\rddgis\cvec\cvec_gas_water_species.apr 11:30 p.m. 10-22-2001

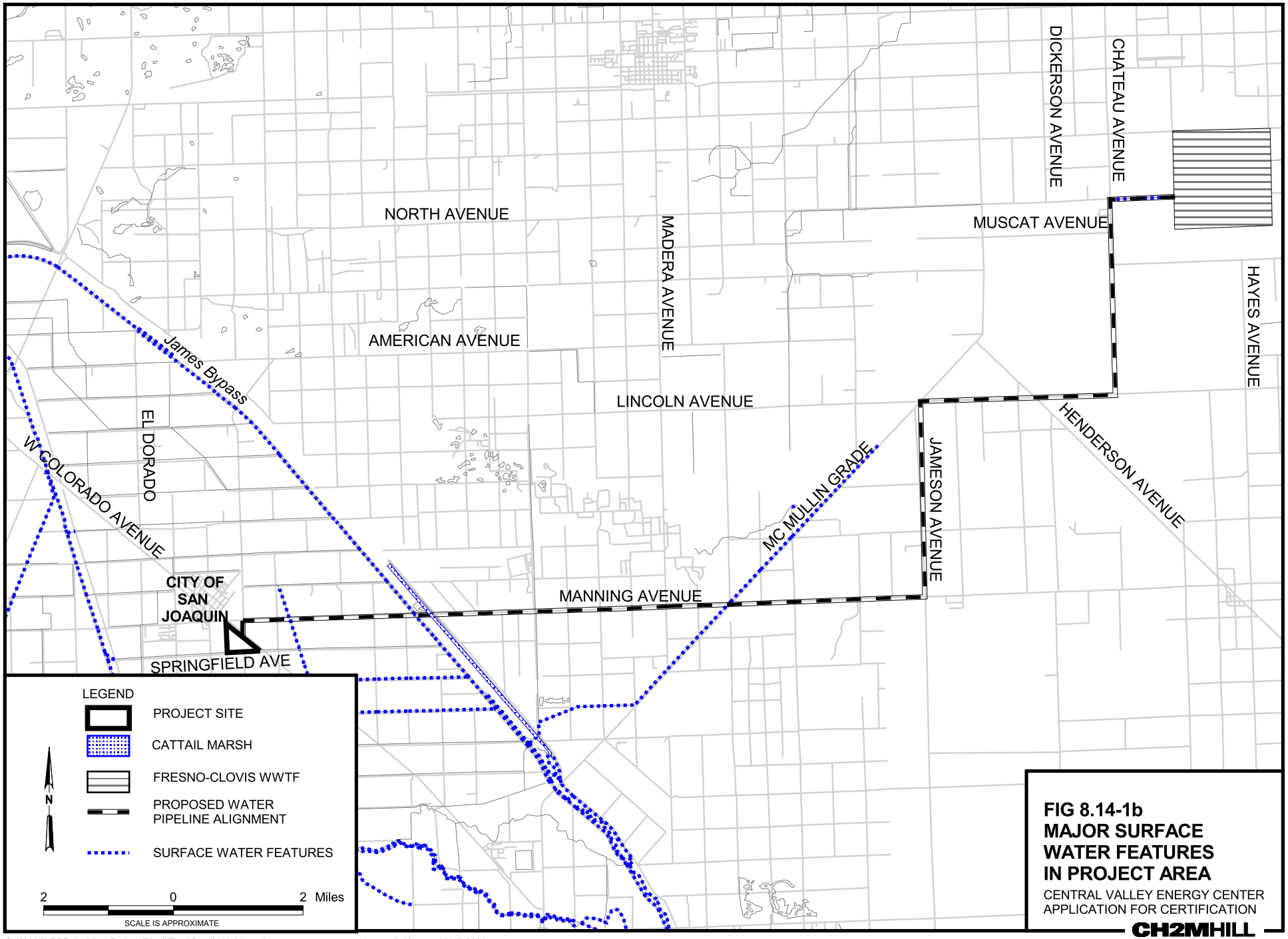


FIG 8.14-1b
MAJOR SURFACE WATER FEATURES IN PROJECT AREA
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION

CH2MHILL

CH2M Hill RDD ArcView Project File \\Thor\Cart1\rddgis\cvec\cvec_gas_water_species.apr 3:12 p.m. 10-17-2001

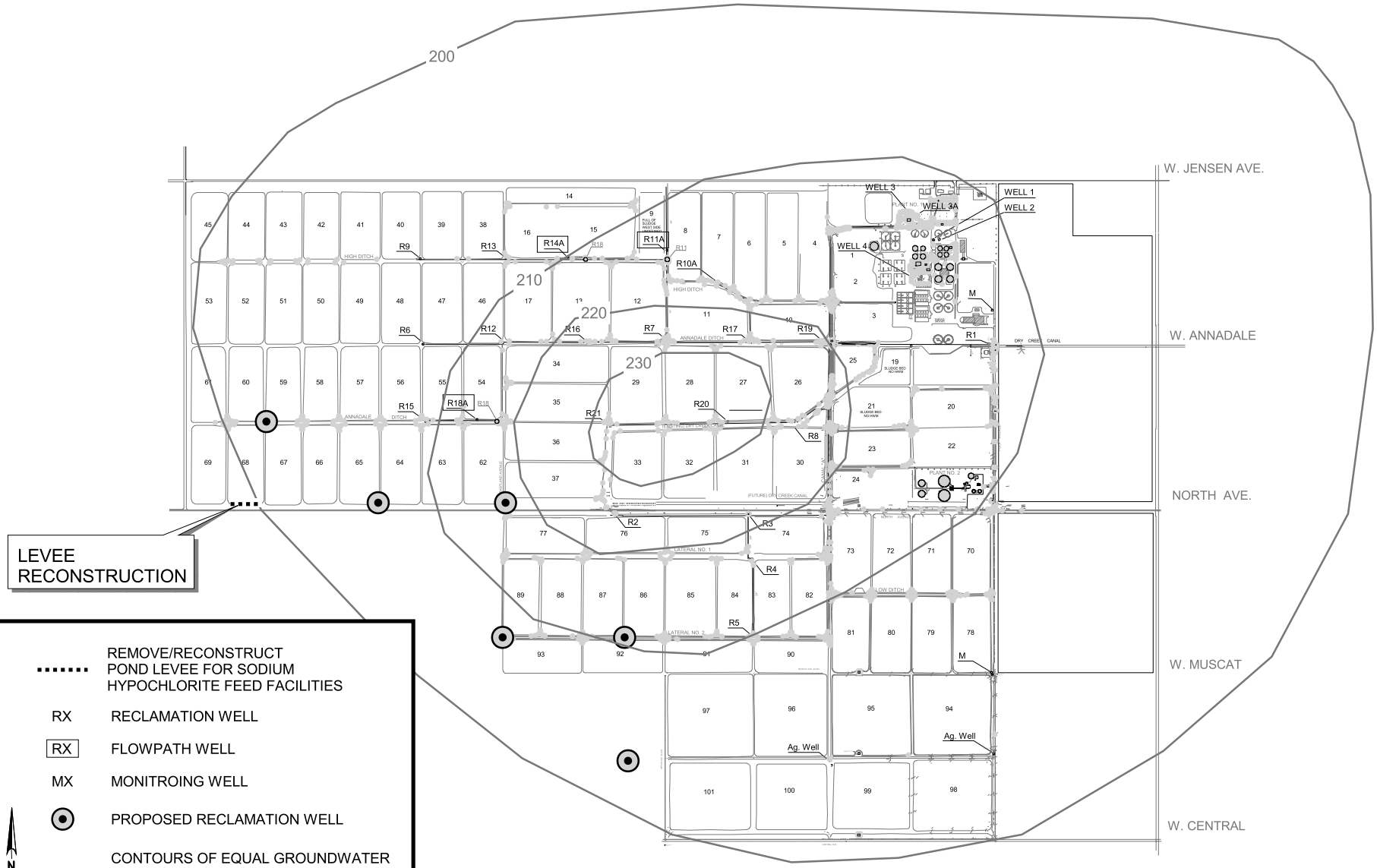


FIGURE 8.14-2
GROUNDWATER ELEVATION UNDER FRESNO-CLOVIS WWTF
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION

CH2MHILL

CH2M Hill RDD ArcView Project File \\Thor\Cart1\rddgis\cvec\cvec_cad.apr 4:44 p.m. 10-17-2001

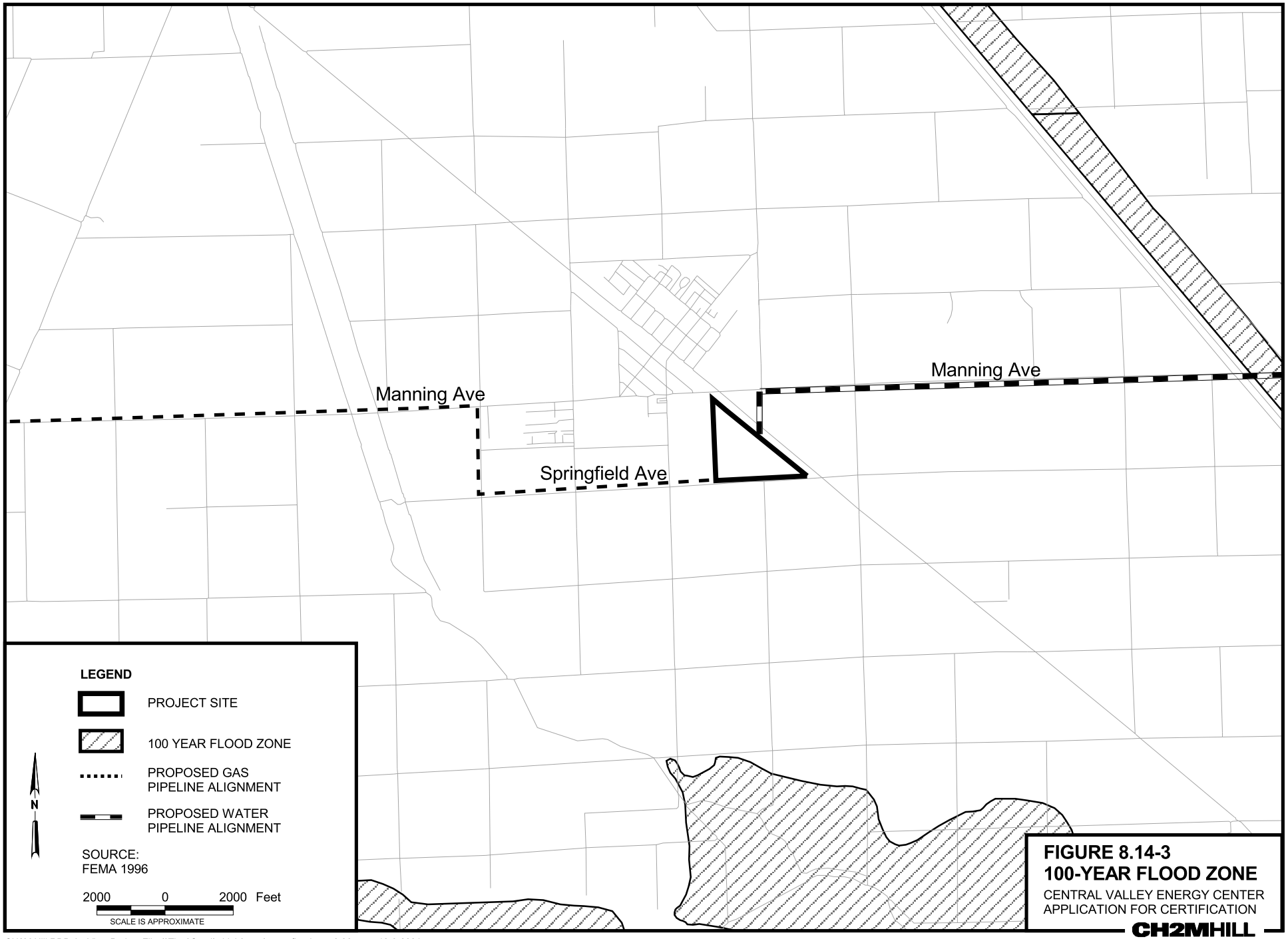
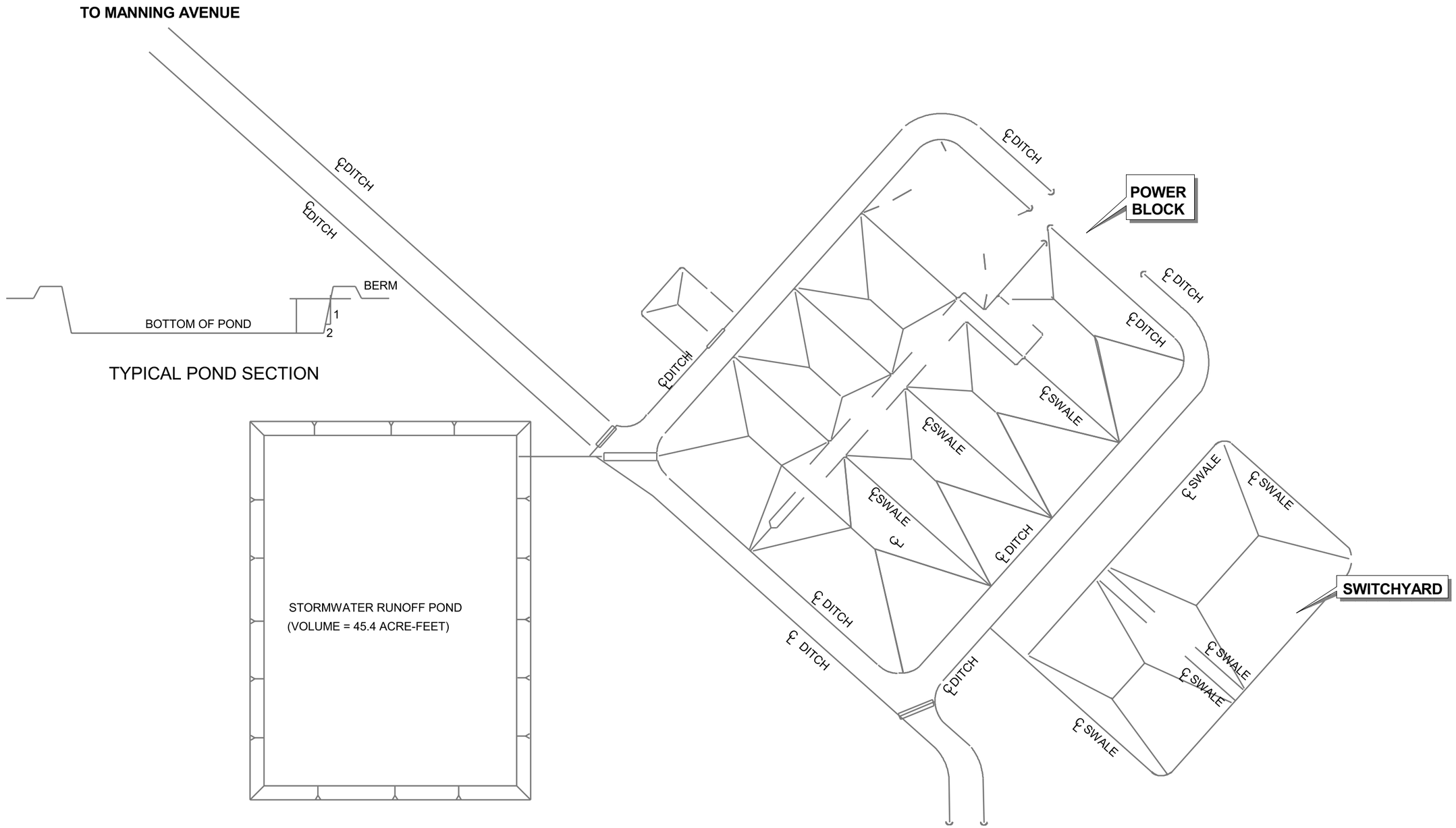


FIGURE 8.14-3
100-YEAR FLOOD ZONE
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION
CH2MHILL



NOT TO SCALE

SOURCE:
CALPINE, INC.

FIGURE 8.14-4
CVEC PROPOSED DRAINAGE FACILITIES
CENTRAL VALLEY ENERGY CENTER
APPLICATION FOR CERTIFICATION

CH2MHILL